93209-00442
April 2015

Foreword

To ensure good machine performance, reduce failures or problems, and prolong the service life of each component, it is necessary to operate the machine as is directed in the Operator and Maintenance Manual.

To effectively diagnose and repair the machine, it is important to follow the guidelines laid out in this Shop Manual.

General Information
Function and structure

For the engine, refer to the engine Shop Manual provided by the engine manufacturer.

The purpose of this manual is to provide information on the product and the correct maintenance and repair methods. Please read this manual to ensure correct troubleshooting and good repair service.

This manual will be periodically reviewed and revised for more satisfactory content. If you have any opinion or requests, please inform us.

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Cautions on Safety

⚠ WARNING

Unexpected movement of the machine may cause an accident resulting in injury or death.
Therefore, to provide repair service with the engine running, be sure to observe the following items:

- Park the machine on level ground.
- Apply the parking brake.
- Block the tires with chocks to prevent the tires from moving.
- Determine the signals between the service man.
- Prohibit any person from walking into dangerous areas.
    - Near articulation areas of the machine
    - Under the machine
    - Around the engine
    - In front of or behind the machine

⚠ WARNING

Operation under the boom or the bucket may lead to severe accidents.
Make sure to apply the safety lock of the boom and the bucket control lever provided in the cab, remove the starter key, and attach a "DO NOT OPERATE!" tag to the cab.

⚠ CAUTION

Be careful not to be burnt by bursting high pressure oil.
Release the pressure remaining inside the circuit and open the cap of the hydraulic tank before removing the plug from the pressure measurement port so that the internal pressure of the hydraulic tank is released and burst of the high pressure oil can be prevented.

⚠ WARNING

Entering the articulation area of the machine body while the engine is running may cause severe accidents.
Make sure to stop the engine, pull out the starter key, and attach a "DO NOT OPERATE!" tag to the cab before entering the articulation area.

⚠ CAUTION

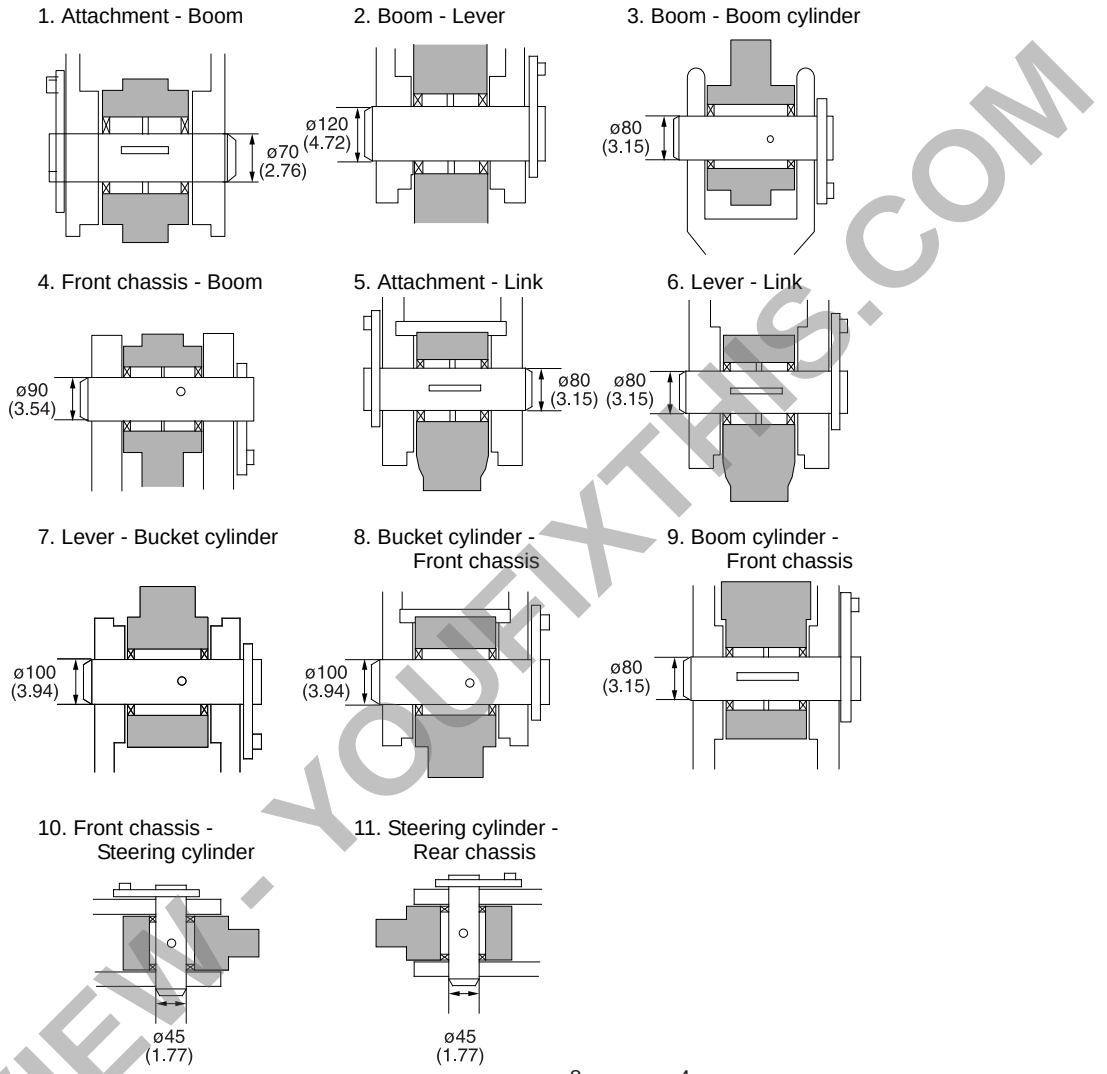
Touching the fan or the V belt of the engine or the hot area while the engine is running may cause severe accidents.
Make sure to stop the engine before opening the engine room access panel.

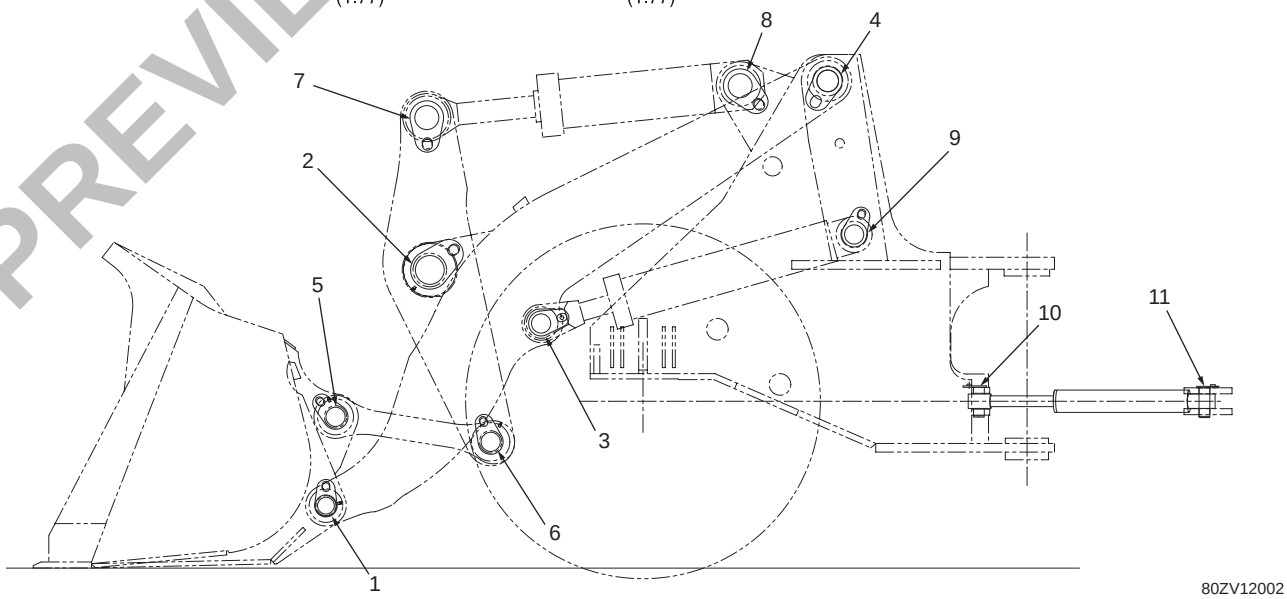
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Loading linkage pin

mm (in)



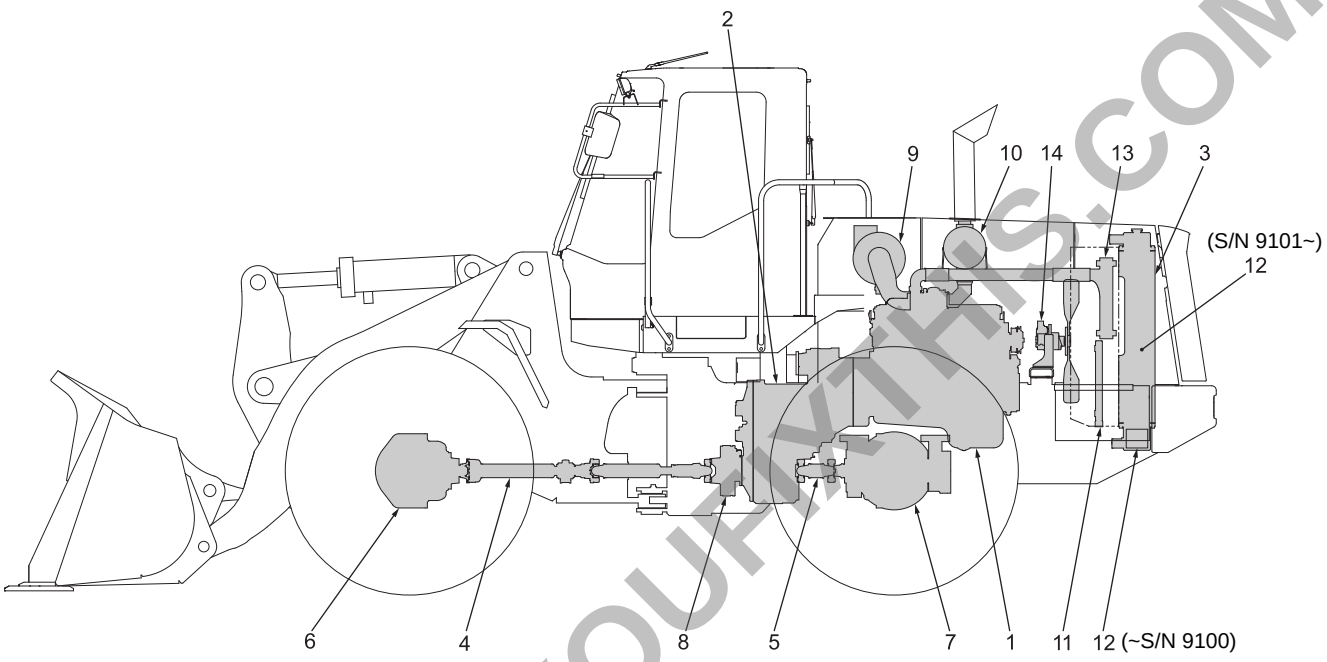


80ZV12002

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Power Line



80V2E22001

1. Engine
2. Torque converter and transmission
3. Radiator
4. 2nd propeller shaft
5. 3rd propeller shaft
6. Front axle differential gear
7. Rear axle differential gear
8. Parking brake
9. Air cleaner
10. Muffler
11. Hydraulic oil cooler
12. Torque converter oil cooler
13. Air charge cooler
14. Fan motor

The power output from the engine is transmitted to the transmission through the torque converter (combined with the transmission). The speed and direction are changed according to the engagement of the transmission clutches. The power is then transmitted through the second and third propeller shafts to the differential gears of front and rear axles.

Finally the power is transmitted through the axles to the planetary gears, and tires to move the machine.

On the back side of the engine, there is a radiator. The radiator incorporates engine coolant, torque converter oil cooler, air charge cooler and an external air type hydraulic oil cooler. On the second propeller shaft side of the transmission, a parking brake is installed.

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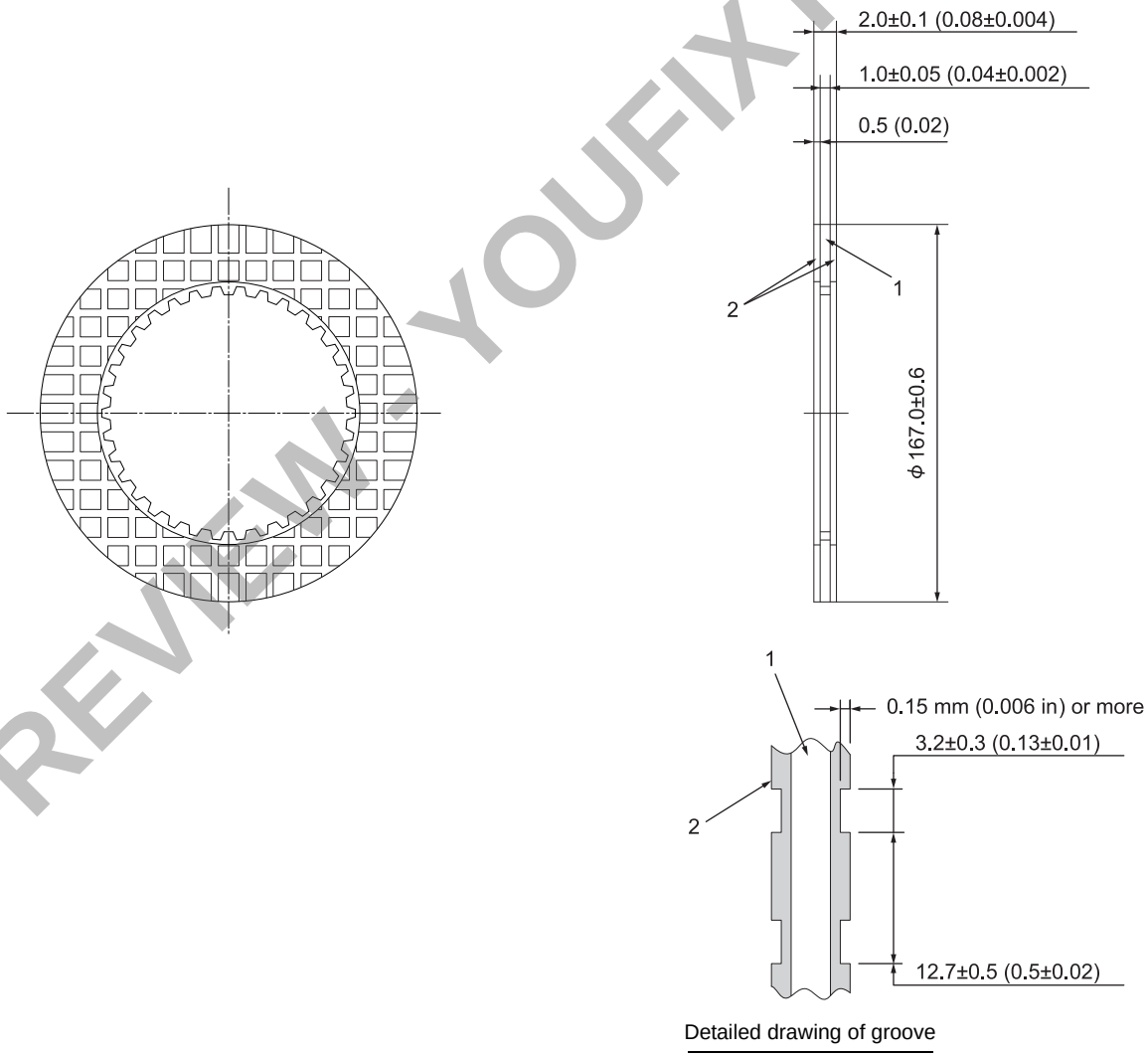
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Clutch specifications

Name of clutch	Piston stroke (mm)	Friction plate				Steel plate				Number of return spring
		Number of plate	Outer diameter (mm)	Inner diameter (mm)	Thickness (mm) New/Wear limit	Number of plate	Outer diameter (mm)	Inner diameter (mm)	Thickness (mm) New/Wear limit	
Forward clutch	3.8±0.3	8	ø167 (6.57 in)	ø104.8 (4.12 in)	2.0±0.1 / 1.8	7	ø182 (7.16 in)	ø116 (4.57 in)	1.8±0.1 / 1.6	20
Reverse clutch	4.3±0.3	8				7				20
1st speed clutch	3.8 $^{+0.5}_{-1.0}$	10				9				16
2nd speed clutch	3.0±1.0	5				4				16
3rd speed clutch	3.0±1.0	5				4				16
4th speed clutch	2.95±1.0	5				4				16

Note: All friction plates, steel plates and return springs are the same for each clutch.

Friction plate: mm (in)



Detailed drawing of groove

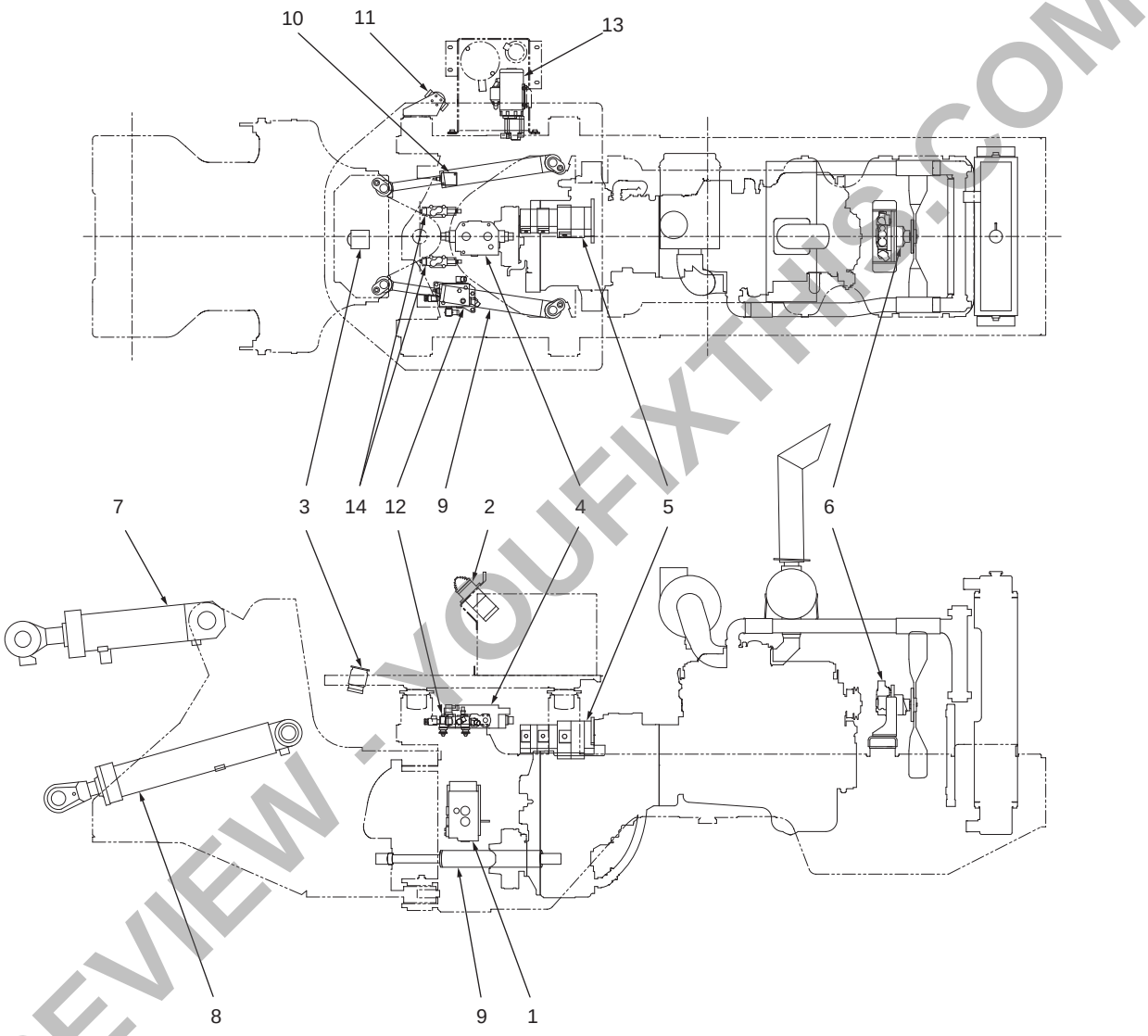
80ZV32001

1. Plate
2. Facing

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Layout of Hydraulic Units



K80V2E42001

1. Multiple control valve
2. Pilot valve
3. Orbitrol®
4. Steering valve
5. Hydraulic pump (3 section)
6. Fan motor
7. Bucket cylinder
8. Boom cylinder
9. Steering cylinder
10. Reducing valve (Steering pilot)
11. T/C line filter
12. ELS valve
13. Secondary steering pump
14. Stop valve

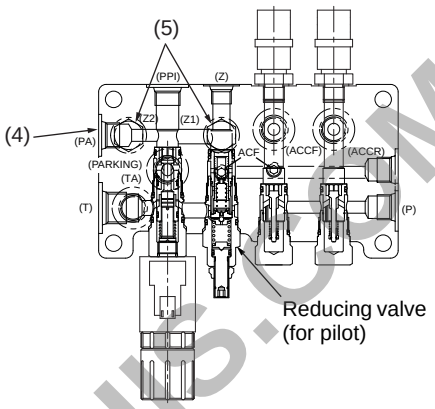
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Gauge port

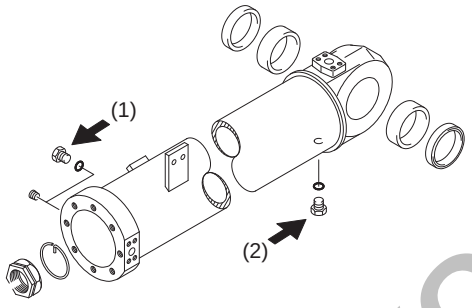
	Gauge port location	Port size
Main relief pressure	(1), (2), (3)	(1), (2), (3) G (PF) 1/4 with O-ring
Overload relief pressure	(1), (2), (3)	
Pilot line pressure (Reducing valve)	(4), (5)	(4) G (PF) 3/8 with O-ring (5) G (PF) 1/4 with O-ring

Valve assembly



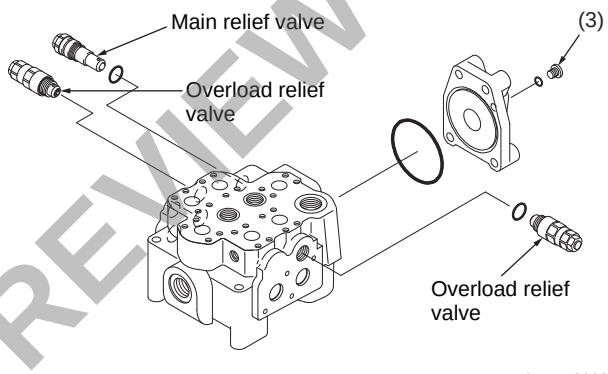
85V2E43001

Bucket cylinder



80ZVE43001

Multiple control valve



70ZVE43002

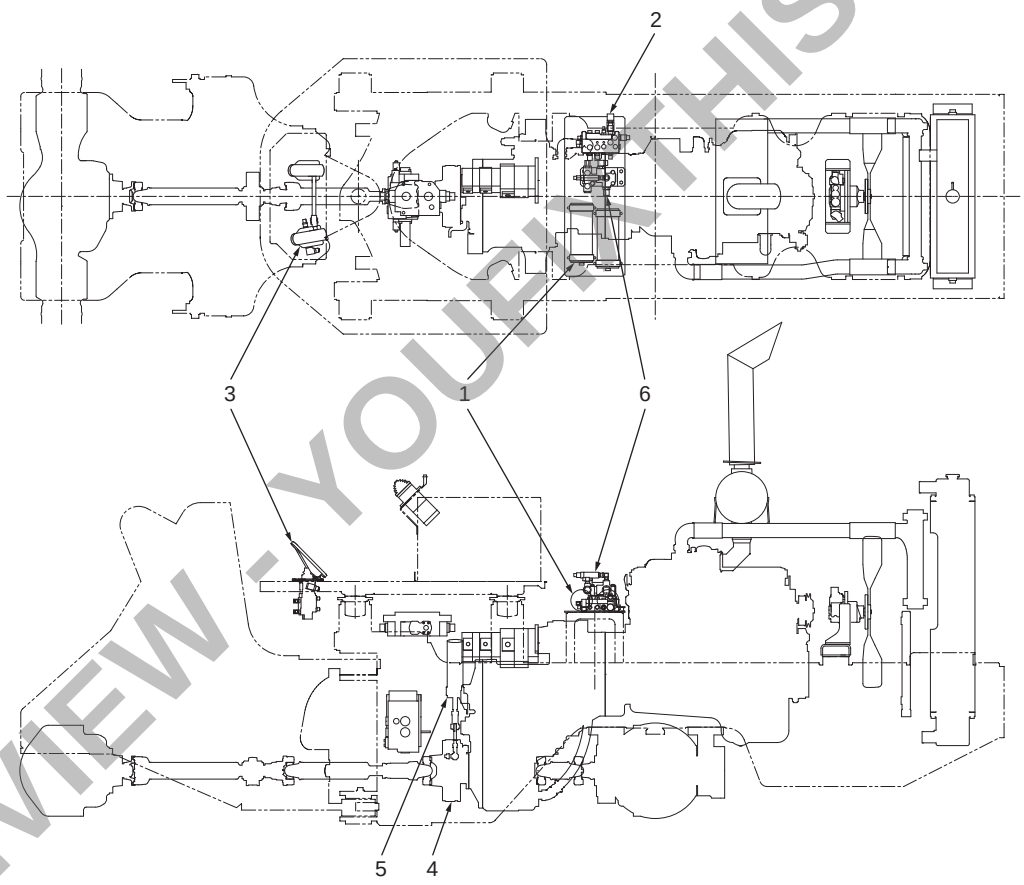
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Brake Units Layout

The brake system is the all-hydraulic type, and has two independent systems consisting of the front system and the rear system for enhancing safety.

The service brake is the wet disc type. The parking brake is the internal expansion drum type.



80V2E52001

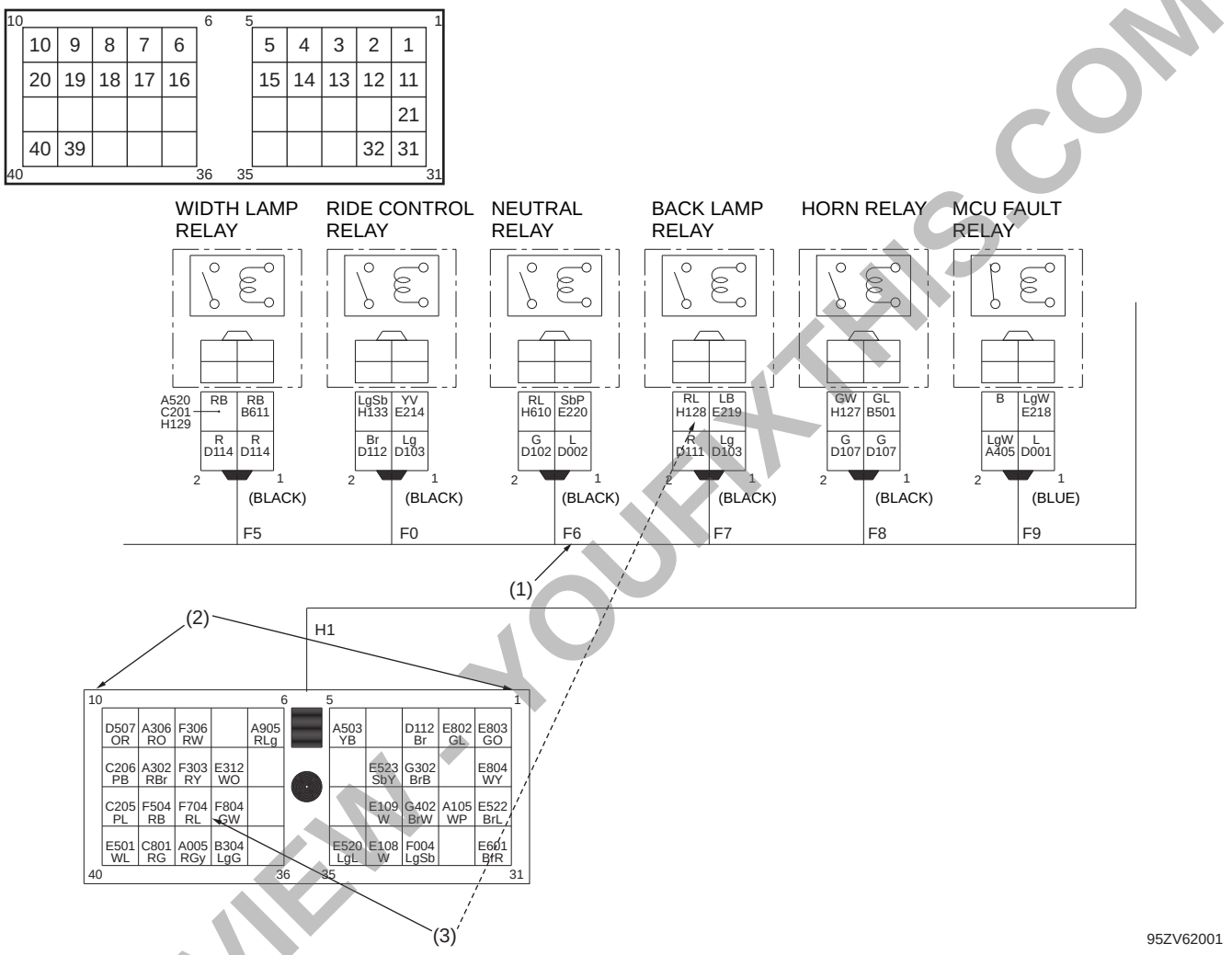
1. Accumulator
2. Solenoid valve (for parking)
3. Brake valve
4. Parking brake
5. Spring chamber (for parking brake)
6. Unloader valve

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How to Use Electrical Wiring Diagram

Example



95ZV62001

The address method is used for electrical wiring diagrams. For this method, a symbol is attached to each connector and connector terminal in order to easily locate the other terminal where the other end of the cable is connected.

Example 1
Symbol under (or above) connector, such as F6:
Shows the address of the connector.

Example 2
Symbol at the multi-terminal connector, such as 1 and 10:
Shows the terminal number and the numbering direction.

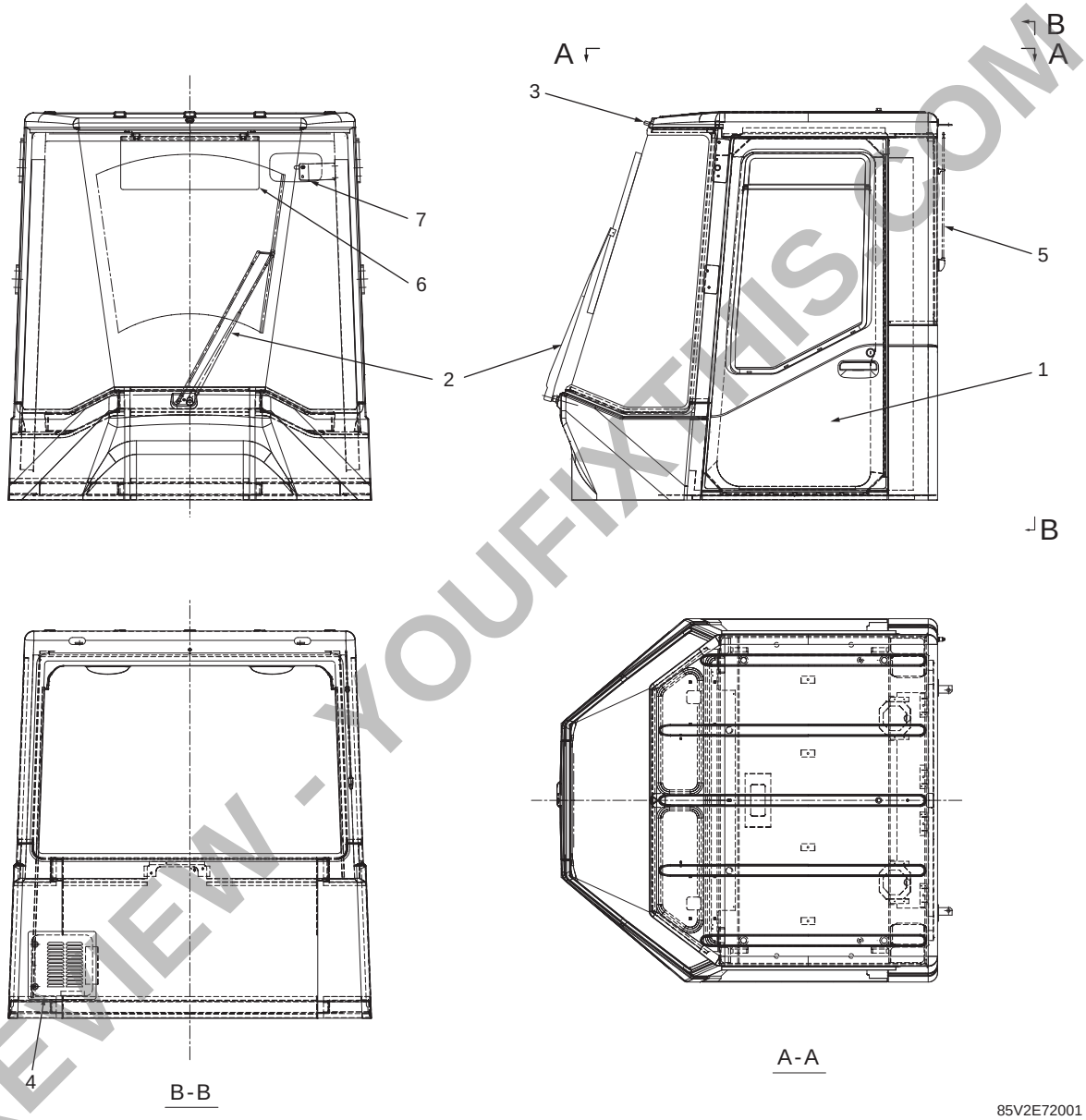
Example 3
Checking the other connector terminal where F704 RL (item (3)) is connected:

1. F704
   Shows that the terminal is connected to the 4th terminal of the F7 connector.
   Check the description in the 4th terminal of the F7 connector (F704), it shows that the F704 terminal is connected to H128. This means that the 4th terminal of the F7 connector is connected to the 28th terminal of the H1 connector.
2. RL
   Shows the color of the wire "RL" represents that the insulation color is red, and "L" represents a blue stripe is on the red insulation.

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Cabin



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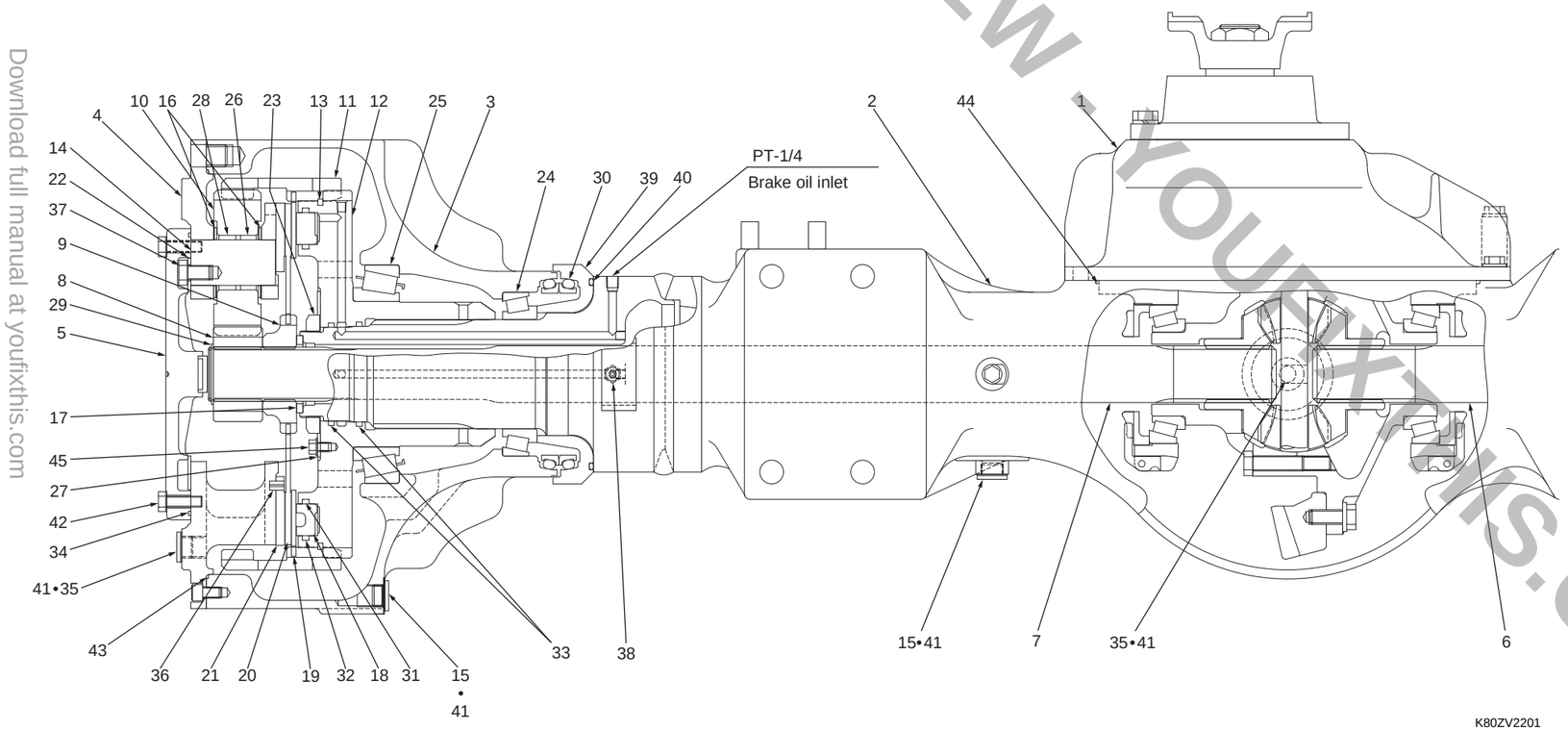
The cabin equipped with the ROPS (Roll Over Protective Structure) is provided as standard.

1. Door (left side)
2. Front wiper
3. Window washer jet nozzle
4. Outside air suction port (air conditioner)
5. Antenna
6. Sun visor
7. Rear view mirror

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Axle Assembly

The only difference between the front and rear axle is the differential housing (1) and axle housing (2).
Other parts are the same as the rear axle assembly.



1. Differential assembly
2. Axle housing assembly
3. Wheel hub
4. Spider (planetary carrier)
5. Cover
6. Axle shaft
7. Axle shaft
8. Sun gear
9. Disc gear
10. Planetary gear
11. Internal gear
12. Internal gear hub
13. Snap ring
14. Planetary pin
15. Plug
16. Wear ring
17. Wear ring
18. Piston
19. Steel plate
20. Friction disc
21. Brake backing plate
22. Plate
23. Axle nut
24. Taper roller bearing (inner)
25. Taper roller bearing (outer)
26. Needle cage
27. Axle lock plate
28. Needle cage
29. Snap ring
30. Floating seal
31. O-ring
32. O-ring
33. O-ring
34. O-ring
35. Magnet plug
36. Spring pin
37. Bolt
38. Bleed screw
39. Ring
40. O-ring
41. Seal washer
42. Bolt
43. O-ring
44. O-ring
45. Bolt

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93209-00451
August 2011

Foreword

To ensure good machine performance, reduce failures or problems, and prolong the service life of each component, it is necessary to operate the machine as is directed in the Operator and Maintenance Manual.

To effectively diagnose and repair the machine, it is important to follow the guidelines laid out in this Shop Manual.

Disassembly & Reassembly
Service Standard

For the engine, refer to the engine Shop Manual provided by the engine manufacturer.

The purpose of this manual is to provide information on the product and the correct maintenance and repair methods. Please read this manual to ensure correct troubleshooting and good repair service.

This manual will be periodically reviewed and revised for more satisfactory content. If you have any opinion or requests, please inform us.

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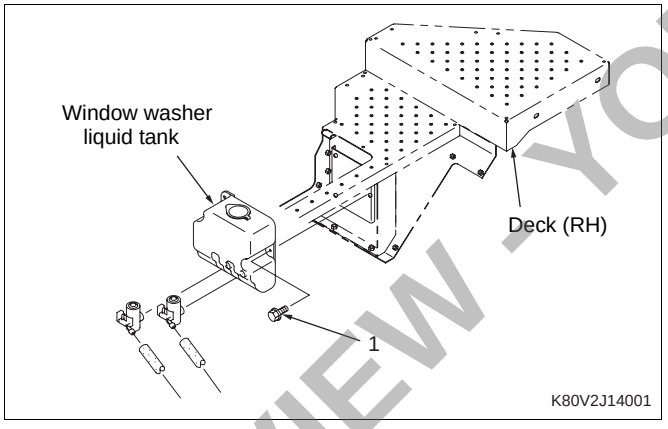
Deck

Deck removing and installing

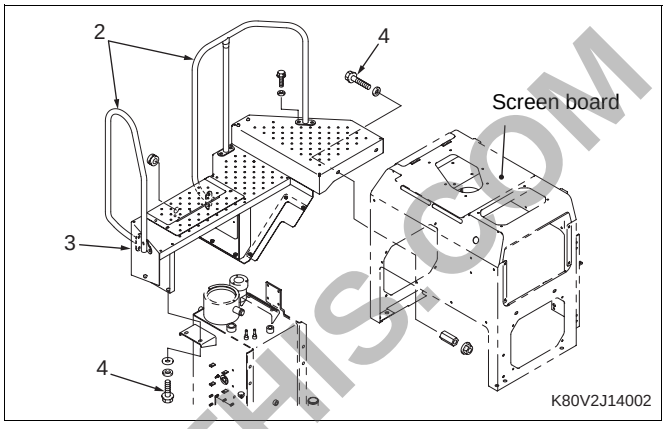
Deck removing

⚠ WARNING

Unexpected movement of the machine could cause an accident resulting in injury or death. Be sure to observe the following items before starting deck removal:
- Position the machine on level ground, and apply the parking brake.
- Lower the attachment onto the ground, and block the tires with chocks, etc. to prevent them from moving.
- Remove the engine key, and hang a "DO NOT START ENGINE!" tag on the steering wheel.

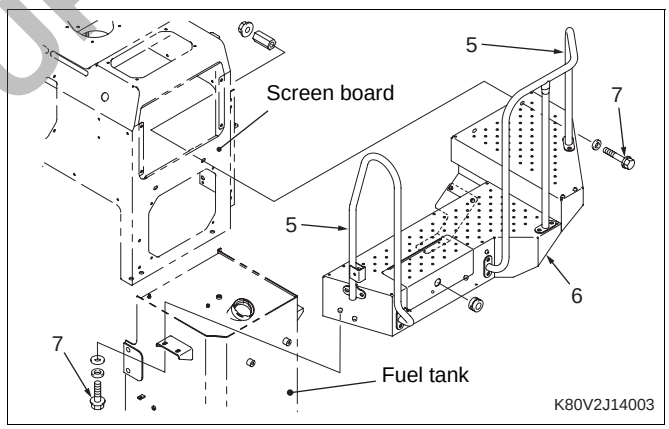


1. Remove bolt (1) and remove the window washer liquid tank from deck (RH).



2. Apply a sling to handrail (2) and deck (3), then remove bolts (4).

: Deck (3) (with handrails): 70 kg (155 lbs)



3. Apply a sling to handrail (5) and deck (6), then remove bolts (7).

: Deck (6) (with handrails): 65 kg (140 lbs)

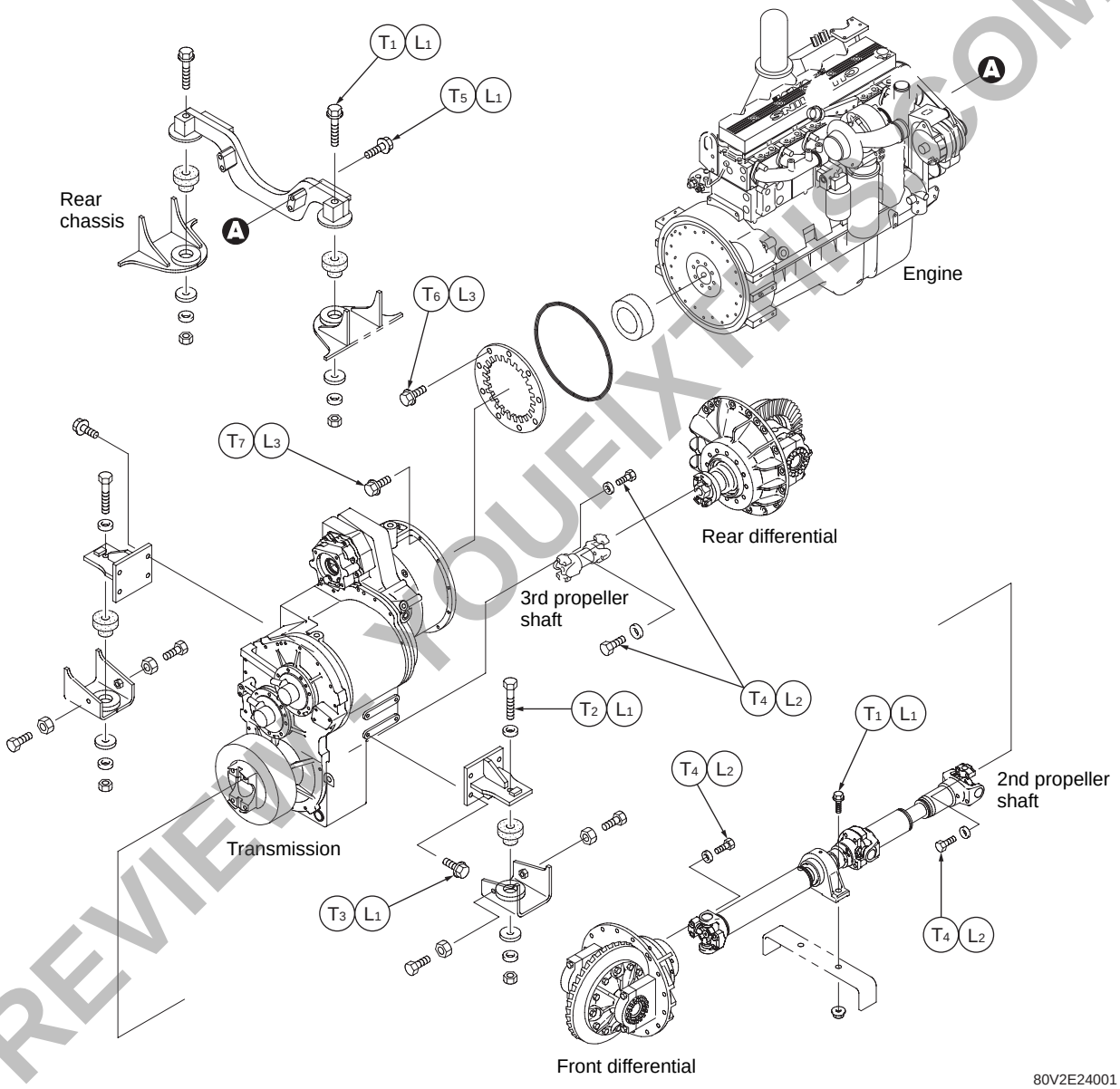
4. While considering the balance, remove decks (3)(6) together with the handrails.

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Power Line

Power line tightening torque



:
T_1: 441 N-m (45 kgf-m) (325 lb-ft)
T_2: 417 N-m (42.5 kgf-m) (307 lb-ft)
T_3: 230 N-m (23.5 kgf-m) (170 lb-ft)
T_4: 142 N-m (14.5 kgf-m) (105 lb-ft)
T_5: 94 N-m (9.6 kgf-m) (69 lb-ft)
T_6: 67 N-m (6.8 kgf-m) (49 lb-ft)
T_7: 53 N-m (5.4 kgf-m) (39 lb-ft)

L_1: Screw lock agent (Loctite® 262)
L_2: Screw lock agent (Three Bond 1327)
L_3: With lubrication oil (Engine oil or gear oil)

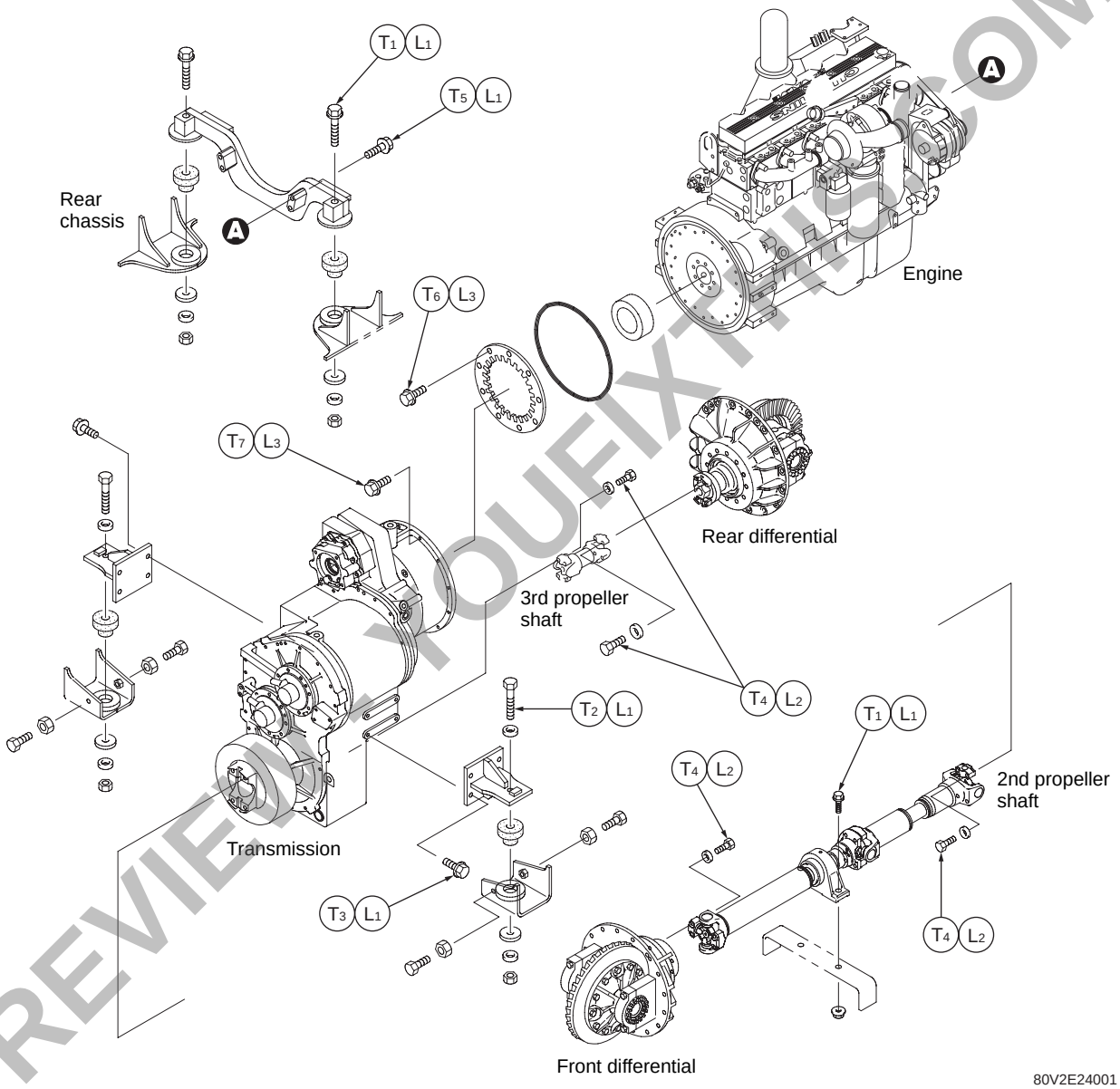
Note
Always replace drive shaft bolts with new ones - never reuse them.

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Torque Converter and Transmission Assembly

Torque converter and transmission assembly tightening torque



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:
T_1: 441 N-m (45 kgf-m) (325 lb-ft)
T_2: 417 N-m (42.5 kgf-m) (307 lb-ft)
T_3: 230 N-m (23.5 kgf-m) (170 lb-ft)
T_4: 142 N-m (14.5 kgf-m) (105 lb-ft)
T_5: 94 N-m (9.6 kgf-m) (69 lb-ft)
T_6: 67 N-m (6.8 kgf-m) (49 lb-ft)
T_7: 53 N-m (5.4 kgf-m) (39 lb-ft)

L_1: Screw lock agent (Loctite® 262)
L_2: Screw lock agent (Three Bond 1327)
L_3: With lubrication oil (Engine oil or gear oil)

Note
Always replace drive shaft bolts with new ones - never reuse them.

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Hydraulic Pump Assembly

Hydraulic pump assembly removing and installing

Hydraulic pump assembly removing

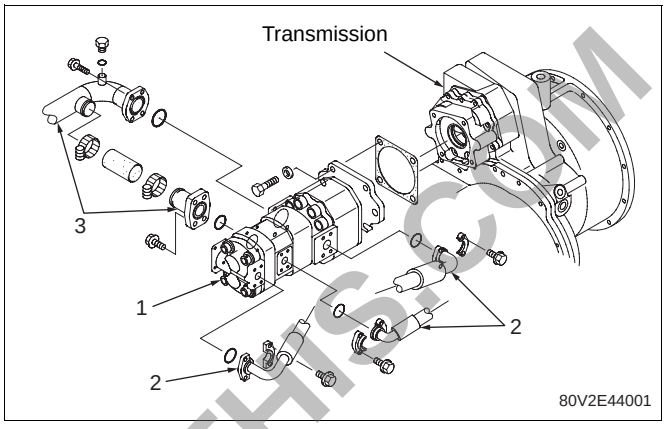
⚠ DANGER

Entering the articulation area while engine is running may cause serious injury or death.
So, when entering the area, stop the engine and place "DO NOT START" or "DO NOT OPERATE" tag on steering wheel.

⚠ CAUTION

Removing hoses and plugs without bleeding residual pressure could cause injuries or burns from hot oil under pressure.
Before removing hoses and plugs, relieve residual pressure. Relieve internal pressure from hydraulic tank to prevent oil from spraying.

Before starting work:
- Remove the cab and the floor board by referring to Section 14.
- Clean the area around the hydraulic pump.



1. Disconnect outlet hose (2) and suction hose (3) from hydraulic pump (1).

Note
Cover the disconnected hoses with plastic, plugs or caps to protect from dust and dirt.

2. Remove the hydraulic pump retainer bolts.

   : Bolt: 142 N-m (14.5 kgf-m) (105 lb-ft)

3. Remove hydraulic pump (1).

   : Hydraulic pump: 35 kg (76 lbs)

Hydraulic pump assembly installing

To reinstall the hydraulic pump assembly, follow the above removal procedure in reverse order.
Replace all gaskets and O-rings during reinstallation.

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Unloader Valve

Unloader valve removing and installing

Unloader valve removing

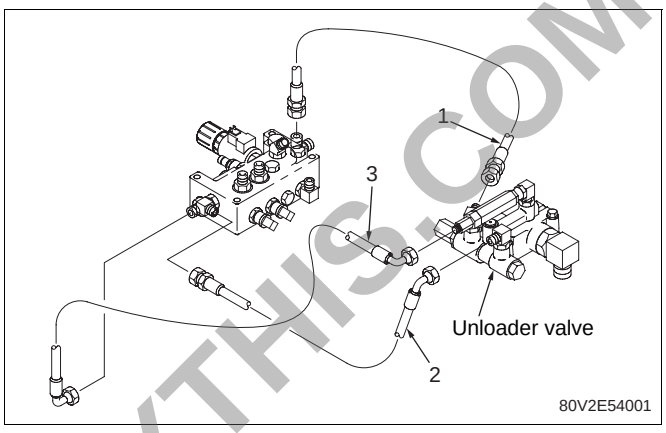
⚠ WARNING

Unexpected movement of the machine could cause an accident resulting in injury or death. To prevent such an accident, observe the following items:
- Park the machine on level ground.
- Block the front wheels with chocks to prevent the wheels from moving.
- Before starting work, be sure to remove the engine key, and hang a "DO NOT START!" tag on the steering wheel or the operator's seat, or disconnect the negative side of the battery.

IMPORTANT

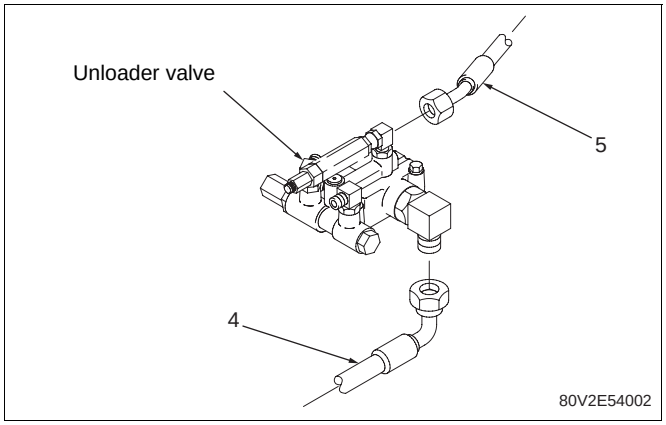
If a battery terminal is removed from a machine in less than 30 seconds after the key is put into the “OFF” position, it can corrupt the ECM program, which can disable the engine. Always wait 1 full minute to be sure to be past this “write to memory function” prior to removing battery terminals.

Before starting work:
- Stop the engine. Depress the brake pedal many times until there is no brake pressure.
- Press the hydraulic tank cap, and relieve the internal pressure from the hydraulic tank.
- Prepare a container to catch drained oil.



1. Remove hoses (1)(2)(3) from the unloader valve.

Note
Cover the disconnected hoses with plastic, plugs or caps to protect them from dust and dirt.



2. Remove hoses (4)(5) from the unloader valve.

Note
Cover the disconnected hoses with plastic, plugs or caps to protect them from dust and dirt.

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Air Conditioner

Air conditioner removing and installing

Air conditioner removing

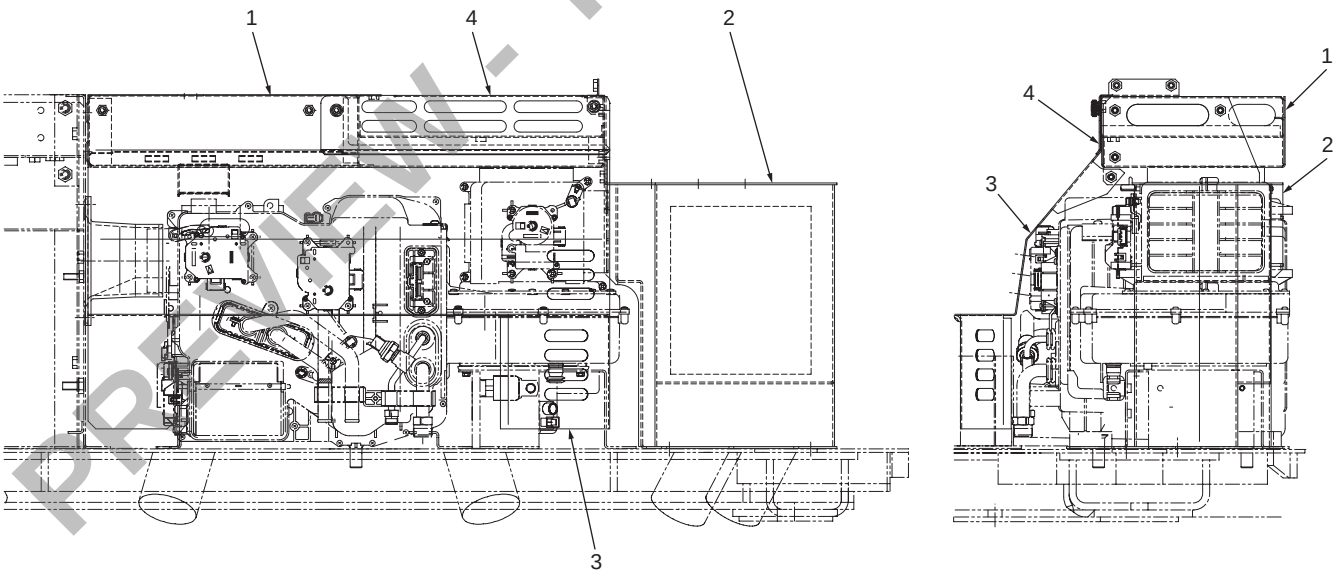
IMPORTANT

In case that it is necessary to replace the air conditioner parts, be sure to set the air conditioner mode as below before removing the air conditioner unit from the machine.

Temperature control: Max cool
Ventilation mode: Foot
Air intake control: Inside air circulation

Before starting work:

- Remover the seat in the cab.
- Collect the air conditioner refrigerant using the proper recovery method.
- Remove the floor mat in the cab.



View from operator's seat

95ZVE74001

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Kawasaki

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80ZV-2 SHOP MANUAL Troubleshooting

93209-00460

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Kawasaki

93209-00460
May 25, 2009

SHOP MANUAL

WHEEL LOADER

80ZV-2

Troubleshooting

Measurement for Performance Check

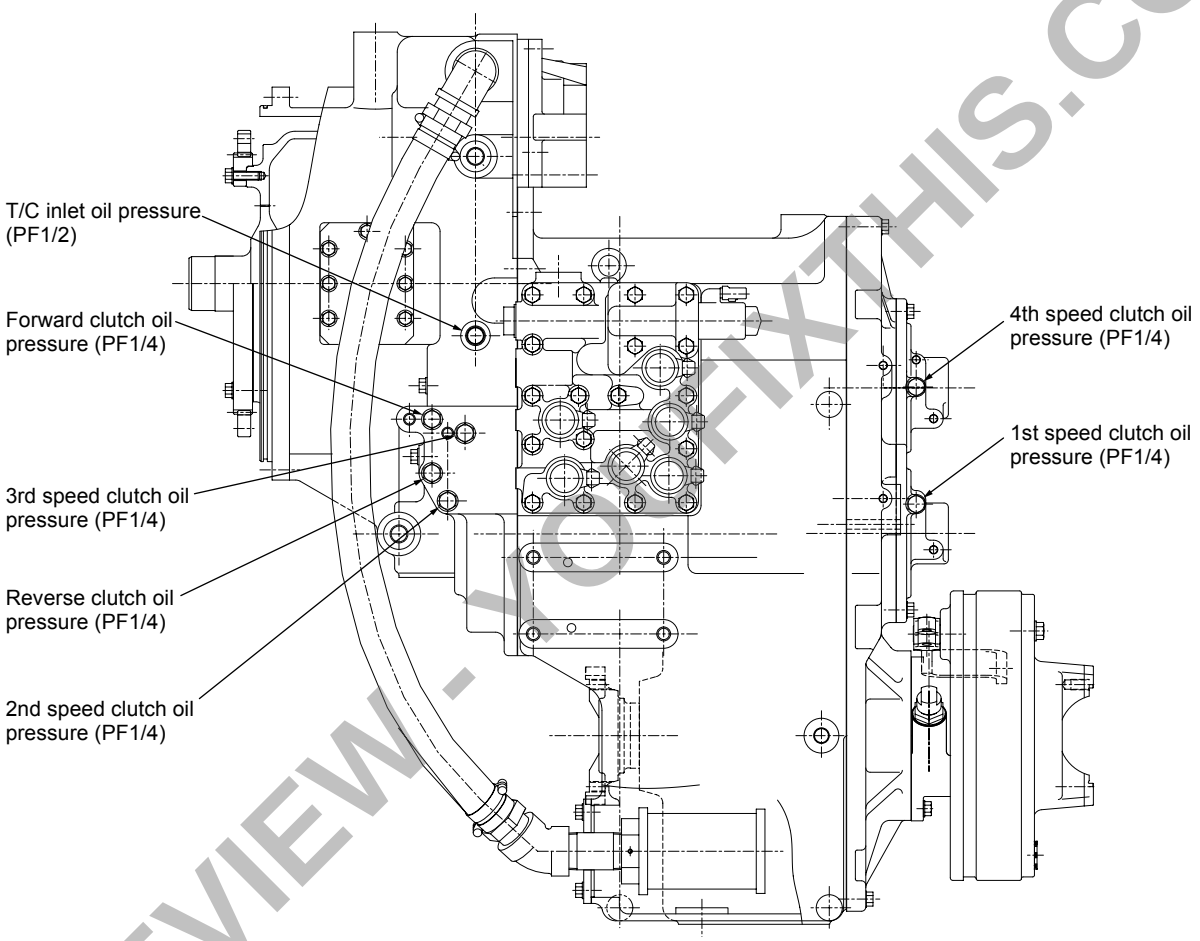
Check & Adjustment

Powered by CUMMINS QSC8.3 ENGINE

Serial No. 80C5-9001~

Clutch Oil Pressure

Measuring clutch oil pressure



80ZVE32030

⚠ WARNING

Unexpected movement of the machine may cause an accident resulting in injury or death.
To prevent such an accident during clutch oil pressure measurement, be sure to closely communicate with the person in the cab by giving signals to each other. Also use a gauge with a hose long enough to reach outside from the articulation area.

- Pressure gauge 2 MPa (20 kgf/cm^2) (284 psi) with 2~3 m hose
- Clutch oil pressure measurement value :
  1.3±0.2 MPa (13±2 kgf/cm^2) (185±28 psi) at engine idling speed (LI)
  1.5±0.2 MPa (15±2 kgf/cm^2) (213±28 psi) at engine maximum speed (HI)
- Torque converter oil temperature :
  50~80ºC (120~180ºF)

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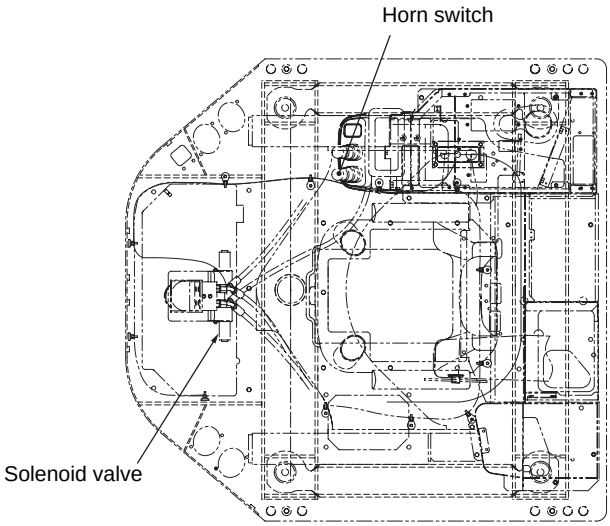
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Linkage Pin 13-2
Liner 13-2

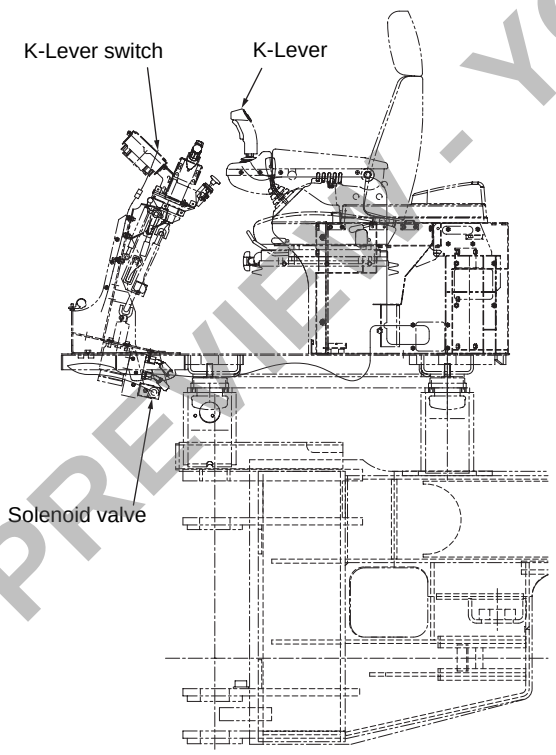
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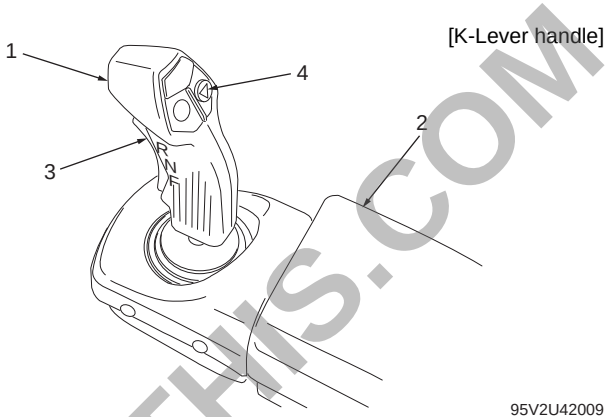
K-Lever (OPT)

Hydraulic circuit





80V2U42008



1. K-Lever
2. Arm rest
3. Forward/Reverse changeover switch (on K-Lever)
4. Downshift button (on K-Lever)

When the K-Lever system is turned on, it allows quick easy steering, directional control, and down shifting on one joystick type lever. On the other hand, the steering can be applied by use of the steering wheel and it over-rides the K-Lever system.

The transmission forward and reverse (F/R) changeover switch and the downshift button are built into the K-Lever. This allows the operator to change the direction and speed of the machine without releasing the K-Lever.

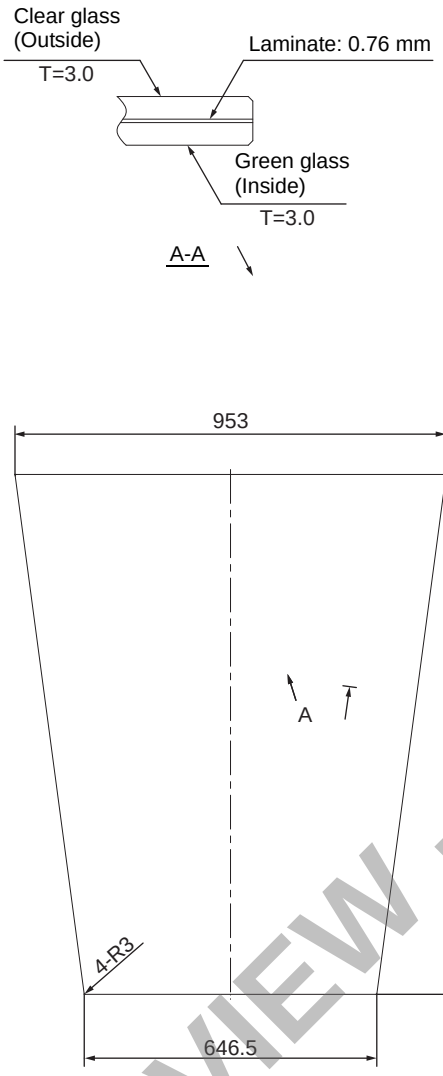
The K-Lever handle is connected to a potentiometer.

This potentiometer changes the input voltage from 2.5 V DC down to 0 V DC, or from 2.5 V DC up to 5 V DC and is interpreted as input voltage at the MCU (machine control unit). 2.5 V DC is input for no steering action. Raising or lowering the voltage creates steering input.

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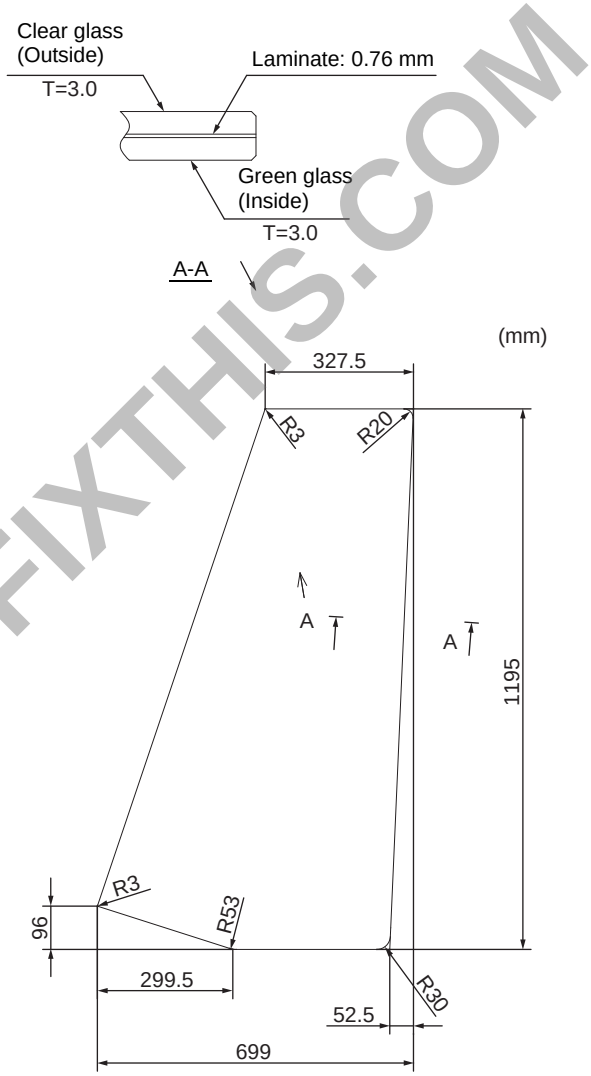
1. Part number 32011-21690



70V2E72002

Note
This glass must comply with ECE REG43.

2. Part number 32011-21700

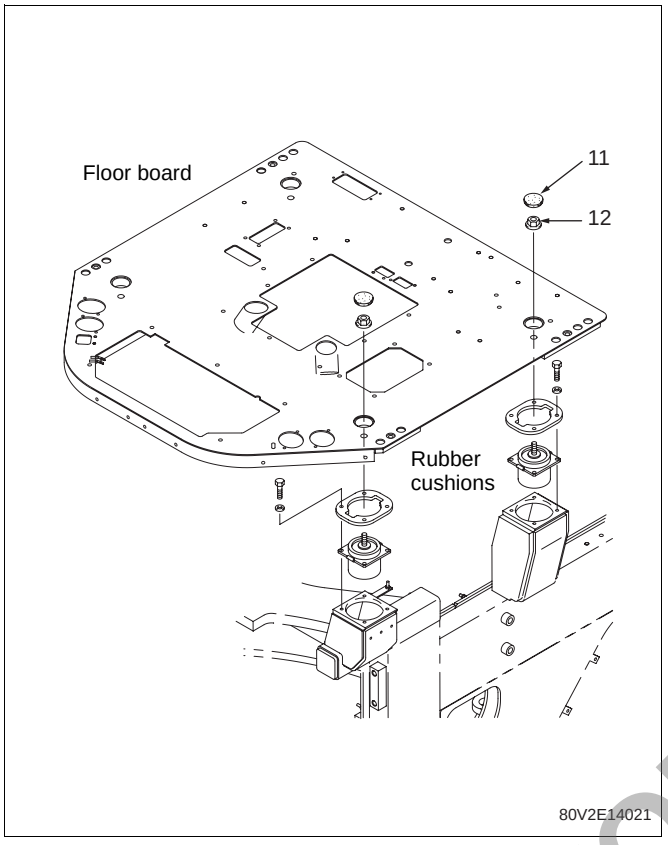


70V2E72003

Note
This glass must comply with ECE REG43.

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6. Remove elastic plug (11) and floor board retaining nut (12).
   Temporarily sling then gradually lift the floor board while checking that there are no obstacles and that all pipes, cables, pins, etc. are disconnected.

: Nut (12): 230 N-m (23.5 kgf-m) (170 lb-ft)
: Floor board assy including ope. stand, control box, etc.: 300 kg (660 lbs)

Reference

: Bolt (13) for the rubber cushion:
76 N-m (7.8 kgf-m) (56 lb-ft)

Floor board installing

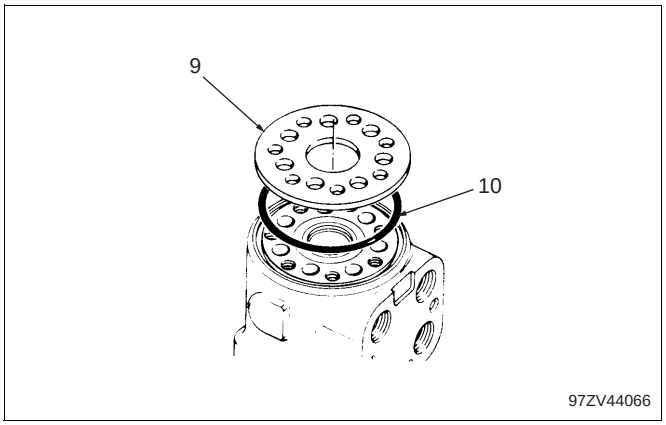
For reinstallation, follow the above procedure in reverse order.

Floor board installation cautions

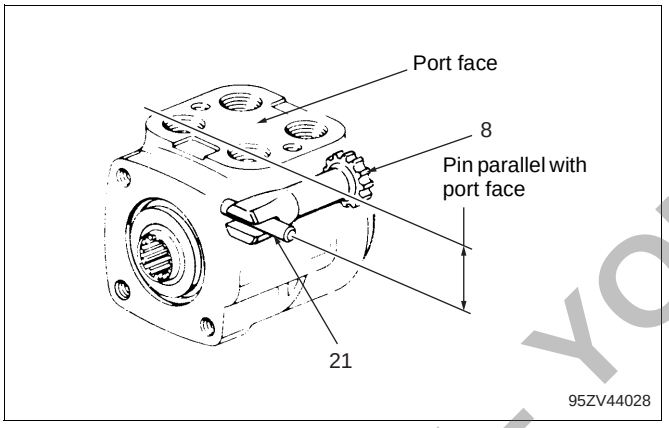
After reinstallation, start the engine, and then check the refrigerant, and oil lines for leakage. Also check operation of the electrical equipment.

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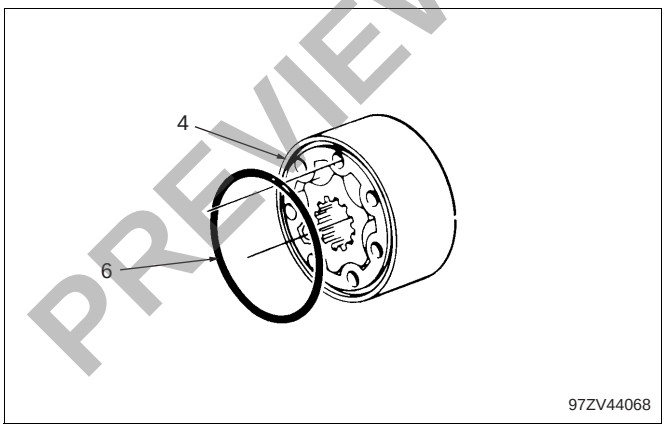
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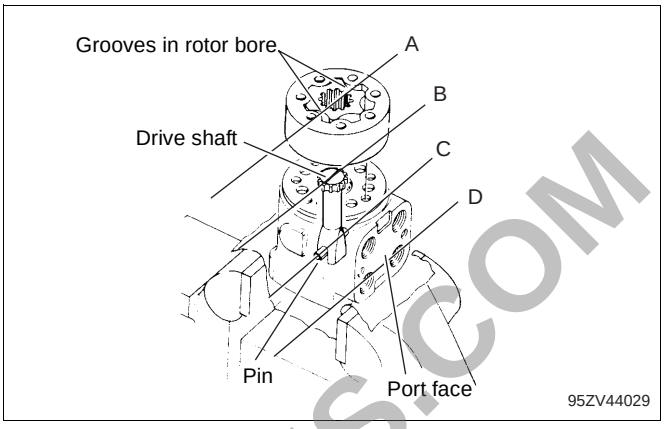
9. Put O-ring (10), then align the bolt holes in plate (9) with those in the housing.



10. Insert drive shaft (8) to fit its yoke with pin (21).



11. Put O-ring (6) in rotor assembly (4).



12. Holding the rotor assembly with the O-ring side facing the plate, install the assembly so that the grooves in the star-shaped bore mesh with the drive shaft.

Note
- Align the bolt holes in the rotor assembly with those in the housing without disengaging the drive shaft from the rotor assembly's star -shaped bore.
- Confirm that lines A, B, C and D are all parallel.

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